

Patent Claims:

1. Gas turbine, especially an aircraft engine, with at least one stator, at least one rotor and at least one generator (19, 29) for generating electrical energy, whereby a rotor comprises a rotor shaft (11) and rotor discs (12, 13, 14) with rotating rotor blades (15) driven by the rotor shaft (11), whereby a stator comprises a housing (17) and stationary guide vanes (18), whereby a generator (19, 29) comprises at least one stator (21, 31) and at least one rotor (20, 30), and whereby the electrical energy produced by the generator (19, 29) preferably serves for driving at least one attachment device or one auxiliary aggregate of the gas turbine, characterized in that the generator (19, 29) is integrated into the interior of the gas turbine in such a way that the or each rotor (20, 30) of the generator is allocated to the rotor and so that the or each stator (21, 31) of the generator is allocated to the stator, whereby kinetic energy of the rotor is convertible into electrical energy by the generator (19, 29).

2. Gas turbine according to claim 1, characterized in that the or each rotor (20, 30) of the generator is allocated to an area of the rotor which is neighboring an area of the stator to which is allocated the or each stator (21, 31) of the generator.

- 1     3.     Gas turbine according to claim 1 or 2, characterized in  
2           that the or each rotor (20, 30) of the generator (19, 29)  
3           is allocated to the rotor shaft (11) of the rotor, whereby  
4           the or each rotor (20, 30) comprises several pole pieces  
5           (26) which are secured to the rotor shaft (11) either as a  
6           unit or individually.
- 1     4.     Gas turbine according to claim 3, characterized in that the  
2           pole pieces (26) of the or of each rotor (20) are  
3           interconnected at the radially inwardly positioned ends  
4           (27) by a hollow cylinder shaped element (28) and are  
5           connected as a unit on the rotor shaft (22) of the rotor.
- 1     5.     Gas turbine according to claim 4, characterized in that for  
2           this purpose an inner diameter of the hollow cylinder  
3           shaped element (28) is adapted to an outer diameter of the  
4           rotor shaft (11) of the rotor.
- 1     6.     Gas turbine according to one or more of the claims 1 to 5,  
2           characterized in that the or each stator (21, 31) of the  
3           generator is allocated to a stator-side bearing block (22)  
4           of the rotor shaft (11).
- 1     7.     Gas turbine according to claim 1 or 2, characterized in  
2           that the or each rotor of the generator is allocated to the  
3           rotor blades of the rotor, whereby pole pieces are  
4           integrated into the rotor blades or are allocated to the  
5           radially outwardly positioned ends of the rotor blades.

- 1 8. Gas turbine according to claim 7, characterized in that the  
2 or each stator of the generator is allocated to the housing  
3 of the stator and/or to the stationary guide vanes of the  
4 stator.
- 1 9. Gas turbine according to one or more of the claims 1 to 8,  
2 characterized in that the or each stator (21, 31) of the  
3 generator comprises windings (25), whereby the windings are  
4 cooled by fuel.
- 1 10. Gas turbine according to claim 9, characterized in that the  
2 windings (25) of the or of each stator (21, 31) are  
3 constructed as hollow windings through which fuel flows for  
4 cooling.
- 1 11. Gas turbine according to one or more of the claims 1 to 10,  
2 characterized in that control means operate the generator  
3 (19, 29) as a motor for starting the gas turbine and use  
4 the generator for generating electric energy following the  
5 start of the gas turbine.
- 1 12. Gas turbine according to claim 11, characterized in that  
2 excess electrical energy during the motor operation of the  
3 generator (19, 29) is supplyable into the gas turbine for  
4 driving the rotor of the gas turbine.

1 13. Gas turbine according to one or more of the claims 1 to 12,  
2 characterized in that the gas turbine comprises a high  
3 pressure compressor and a low pressure compressor, whereby  
4 the high pressure compressor as well as the low pressure  
5 compressor each respectively comprises a stator, a rotor  
6 and a generator integrated into the high pressure  
7 compressor or into the low pressure compressor,  
8 respectively.

1 14. Gas turbine according to claim 13, characterized in that  
2 the high pressure compressor and the low pressure  
3 compressor are coupled through the generators integrated  
4 into the compressors, in such a way that a power  
5 equalization between the high pressure compressor and the  
6 low pressure compressor is made possible.

1 15. Gas turbine according to claim 14, characterized in that  
2 when the generator of the high pressure compressor produces  
3 more electrical energy than necessary, this excess  
4 electrical energy is usable by the generator of the low  
5 pressure compressor for driving the rotor of the low  
6 pressure compressor, and in that when the generator of the  
7 low pressure compressor produces more electrical energy  
8 than necessary, this excess electrical energy is useable by  
9 the generator of the high pressure compressor for driving  
10 the rotor of the high pressure compressor.